

Company Secretary
Shell U.K. Limited
Shell Centre
York Road
London
SE1 7NA

Our Ref: PPC/A/1013495
BAT for flaring

Your Ref:

If telephoning ask for:
Ian Brocklebank

16 August 2019

Dear Sir/Madam

**POLLUTION PREVENTION AND CONTROL (SCOTLAND) REGULATIONS 2012 (“the Regulations”)
BEST AVAILABLE TECHNIQUES ASSESSMENT FOR FLARING
PERMIT REFERENCE NUMBER: PPC/A/1013495
SITE: Fife Natural Gas Liquids (FNGL) Plant, Cowdenbeath, Fife**

In April 2018, SEPA served Shell U.K. Limited and ExxonMobil Chemical Limited with Final Warning Letters regarding flaring which was found to be “preventable and unacceptable”. Following a tightening of permit conditions, SEPA instructed Shell U.K. Limited and ExxonMobil Chemical Limited to conduct ‘Best Available Techniques’ (BAT) assessments on 13 June 2018. BAT Assessments were received from both operators on 30 April 2019 which were subject to a rigorous review by technical specialists. BAT Assessments were published by SEPA on www.sepa.org.uk/mossmorran

Following submission of your assessment of Best Available Techniques (BAT) for flaring:

- We find that the Fife Natural Gas Liquids Plant is not currently using all Best Available Techniques for flaring.
- You have not sufficiently demonstrated that your proposed principles, approach and level of upgrade to the plant would achieve BAT and are therefore unacceptable;
- We will move within seven days to vary your operating permit to include required timescales for the implementation of BAT, and the provision of further detail required.

Review of an Assessment of Best Available Techniques for flaring for Fife Natural Gas Liquids Plant

Following Shell U.K. Limited’s submission of an assessment of Best Available Techniques (BAT) for flaring on 30 April 2019, as required by condition 4.3.10 in your permit, this letter summarises SEPA’s review of that document under the Regulations and in respect of the BAT Conclusions for the Refining of Mineral Oil and Gas, in particular the BAT conclusions for flares (BAT 55 and 56).

SEPA agrees that BAT for Shell U.K. Limited Fife Natural Gas Liquids (FNGL) Plant can be achieved by a combination of:

- a) Prevention, and where that is not possible, minimisation of, flaring events;
- b) Use of ground flares; and

- c) Use of elevated flares when required to supplement the ground flare capacity.

Reviewing each of these in turn:

a) Preventing, and where that is not possible, minimisation of, flaring events

Given the identified potential benefits of Flare Gas Recovery, the BAT Assessment fails to justify why this technique should not be installed.

Subsequent to submission of the BAT Assessment on 30 April 2019, Shell have supplied to SEPA the output of the Ethane Disposal Workstream. This document identifies the steps that can be taken at both Fife NGL and St Fergus to reduce gas flows to ExxonMobil's Fife Ethylene Plant (FEP).

SEPA does not accept Shell U.K. Limited's conclusion that practical minimisation of unplanned flaring events, routine planned safety flaring, and large planned safety flaring at FNGL is BAT. Our view is that there are further options for minimisation which should be addressed. Our view is that the installation of Flare Gas Recovery at FNGL is BAT. SEPA intends to vary your permit by 23 August 2019 to require information, relating to the further options for minimisation which should be addressed, to be submitted.

b) Use of ground flares

SEPA notes that Shell U.K. Limited have advised that your intention is that the ground flares located at FNGL only be used for gas from the FNGL Plant operated by Shell U.K. Limited and that ExxonMobil Chemical Limited will provide separate ground flares for gas associated with their operation of the Fife Ethylene Plant (FEP).

This is a change in flaring strategy in that each part of the Installation operated at Mossmorran will use ground flares independently of one another, adopted as BAT, and with no sharing of equipment at a future date to be specified.

The joint-plant BAT study commissioned from AECOM by Shell U.K. Limited and ExxonMobil Chemical Limited indicates that the ground flares at FNGL are not BAT for a number of reasons, including:

- Reliability – Justification has not been provided to demonstrate that a high level of availability can be achieved with the existing ground flares even where these are only used by FNGL.
- Ground flare design – the AECOM report indicates that more modern designs are available which are quieter, more efficient and less visible and in some cases do not require steam for smokeless operation.

A number of additional aspects need to be justified by Shell U.K. Limited:

- Required capacity – It is unclear from the BAT Assessment as to the capacity that it is reasonable to be provided, it considers average flare rates for events in 2017 and performance data between 2014 and 2018, however it does not consider the range of possible scenarios and available designs then justify what capacity should be installed. The BAT Assessment states that it would not be effective to install new ground flares of increased capacity or to increase the capacity of the existing structures through upgrade but does not explain the justification for this statement.
- Current capability - the joint plant report states that the capacity of the ground flares was de-rated to 29 tph ethane/27 tph ethylene whereas the Shell BAT Assessment states a capacity of 27 tph ethane. Additionally it has been noted that during some flaring events a lower capacity of approximately 20-23 tph ethylene appears to be have been achieved.

Overall, the BAT Assessment does not address why it is not appropriate to replace the current ground flares with a newer design, increasing reliability and capacity and giving the benefits above. It is agreed that improvements can be made to the existing ground flares in the short term to improve reliability and maximise current ground flare capacity, so reducing impacts pending their replacement.

SEPA has concluded that BAT for ground flares is:

- A design operational capacity that covers all routine and planned flaring events, including where practicable unplanned shutdown cases.
- A totally enclosed design.
- Monitoring of the flow and composition of flare gas.
- Installation of acoustic insulation.
- A smokeless capacity of 100%.
- Maximum ground flare noise of 85 decibels at 1 metre from the wind/noise barrier of the ground flare.
- Availability of 99%.
- Minimum combustion efficiency of 99%

SEPA does not accept Shell U.K. Limited's conclusion that optimising the maintenance and use of the current ground flares at FNGL is BAT. Our view is that a new ground flare or new ground flares of a design and larger capacity should be installed. SEPA intends to vary your permit by 23 August 2019, to include a timescale for achieving BAT in a condition in the PPC permit, along with the requirement to submit further information relating to the design details of the ground flaring system. If Shell U.K. Limited wish to provide justification to SEPA offering an alternative view of BAT for FNGL, then this should be provided by 22 August 2019.

c) Use of elevated flares when required to supplement the ground flare capacity

SEPA acknowledges that your improvement plan includes replacement of the flare tip with one of the latest design and operators manually controlling the steam supply. However, information needs to be provided to demonstrate that the proposed flare tip and a manual steam control system are BAT. No details are provided on how what is proposed compares with other flare tips that are available. The same applies to monitoring and control of steam and monitoring of flare gas flow and composition, as no details are given, or alternatively a justification as to why they are not applicable to FNGL.

SEPA has concluded that BAT for elevated flaring is:

- Use of a low sound flare burner (or tip) designed with internal steam tubes.
- Monitoring of the flow and composition of flare gas.
- Monitoring of steam flow and ratio control of steam to flare gas to the flare.
- Installation of acoustic insulation (or mufflers).
- A smokeless capacity of 10-15%.

SEPA does not accept Shell U.K. Limited's conclusion that FNGL is BAT for elevated flaring. Our view is that a low sound flare burner (or tip), monitoring and control of steam and monitoring of flare gas flow and composition should be installed. SEPA intends to vary your permit by 23 August 2019, to include a timescale for achieving BAT in a condition in the PPC permit, along with the requirement to submit further information relating to the design details of the elevated flaring system.

SEPA intends to meet with you as a matter of urgency next week, to discuss the contents of this letter. In the meantime, if you have any queries about the contents of this letter please let me know as soon as possible, as SEPA intends to vary your permit, by the 23 August 2019, to include conditions requiring BAT to be implemented. In this event please contact Ian Brocklebank either at our Stirling office or by telephone, 0131 273 7250.

Yours Sincerely,

Chris Dailly
Acting Chief Officer Compliance and Beyond

Cc:
Teresa Waddington, Shell U.K. Limited, Fife Natural Gas Liquids Plant.
Maria Diaz/Angus Pearson, Shell U.K. Limited, Fife Natural Gas Liquids Plant.